

Modeling to Evaluate Fate and Transport of Sediment-Bound Contaminants at Hunters Point Shipyard, California



Hunters Point Shipyard, San Francisco



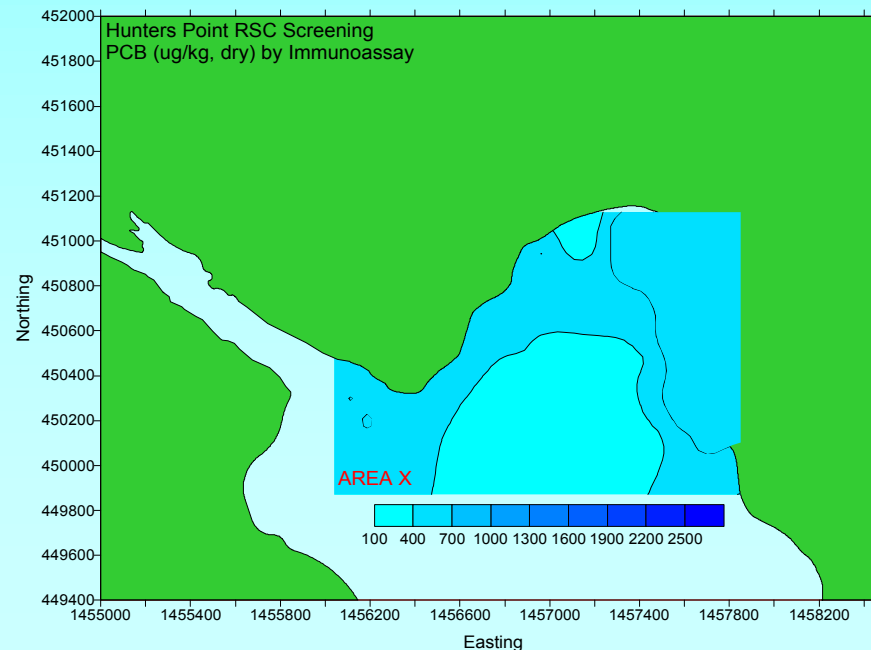
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HPS Sediment Dynamics Study Objectives

- Characterize fate and transport of sediment-bound contaminants
- Estimate sediment accumulation rates
- Predict likelihood of subsurface sediment remobilization under various conditions including extreme events
- Data will support feasibility study, including evaluation of monitored natural recovery

South Basin: Monitored Natural Recovery?

- Steep chemical concentration gradient; potentially large offshore area with relatively lower concentrations
- Higher chemical concentrations at depth
- South Basin not likely to be subject to dredging or construction in the future

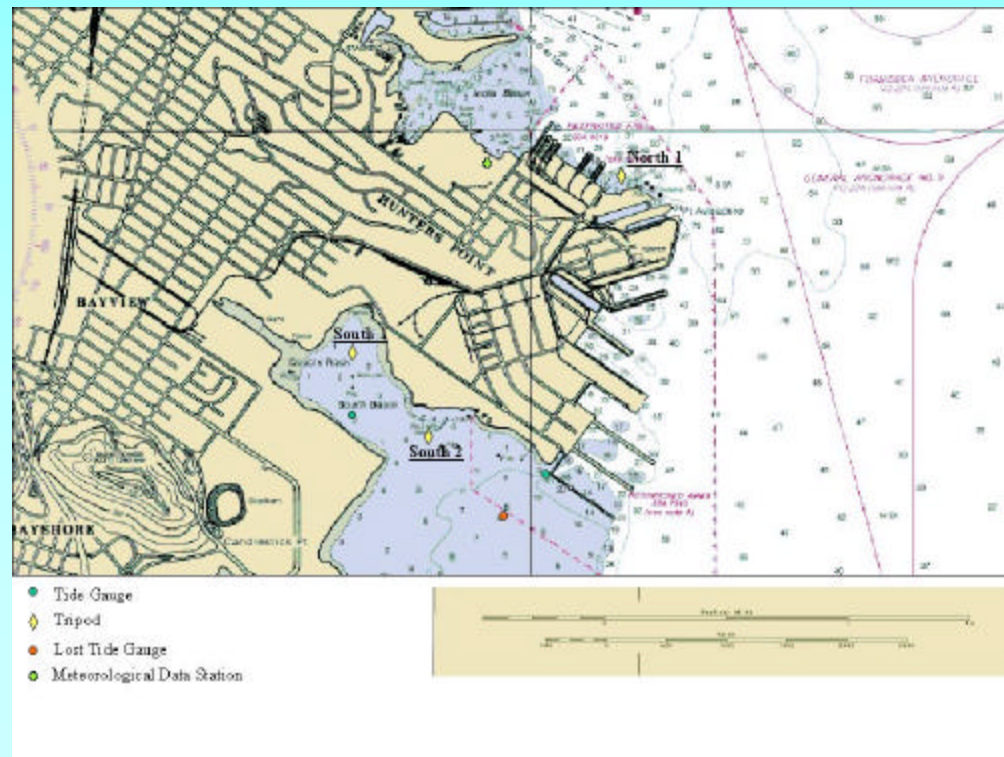


HPS Sediment Dynamics Study Overview

- Initial evaluation using readily available data suggested that average wave conditions in shallow areas would cause resuspension
- Site-specific measurements of waves, currents and suspended sediment concentrations for one tidal cycle in winter and summer
- Predictive sediment transport modeling
- Radioisotope profiles of cores (^{210}Pb and ^{137}Cs)

HPS Sediment Transport Measurements

Time-series measurements of waves, currents and suspended sediment concentrations for one tidal cycle in winter (Jan-Feb 2001) and summer (July 2001) at three stations

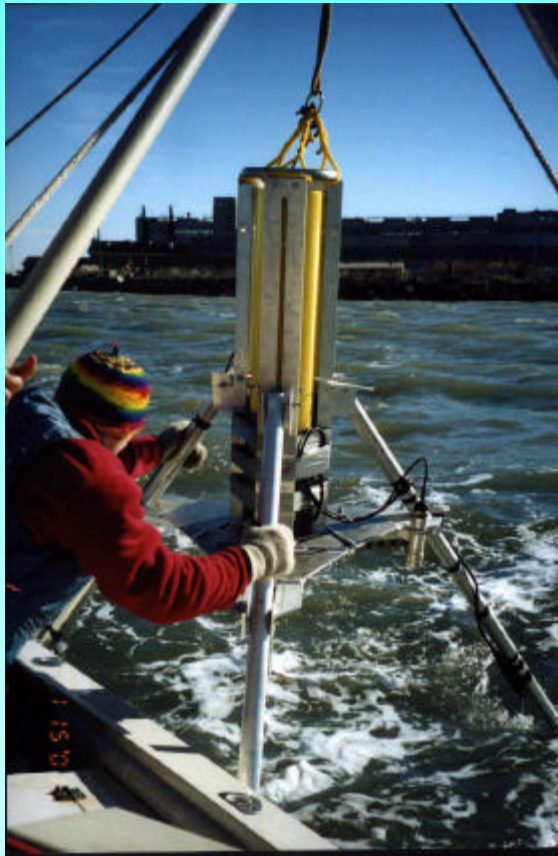


Sediment Transport Measurement System (STMS)



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STMS Deployment

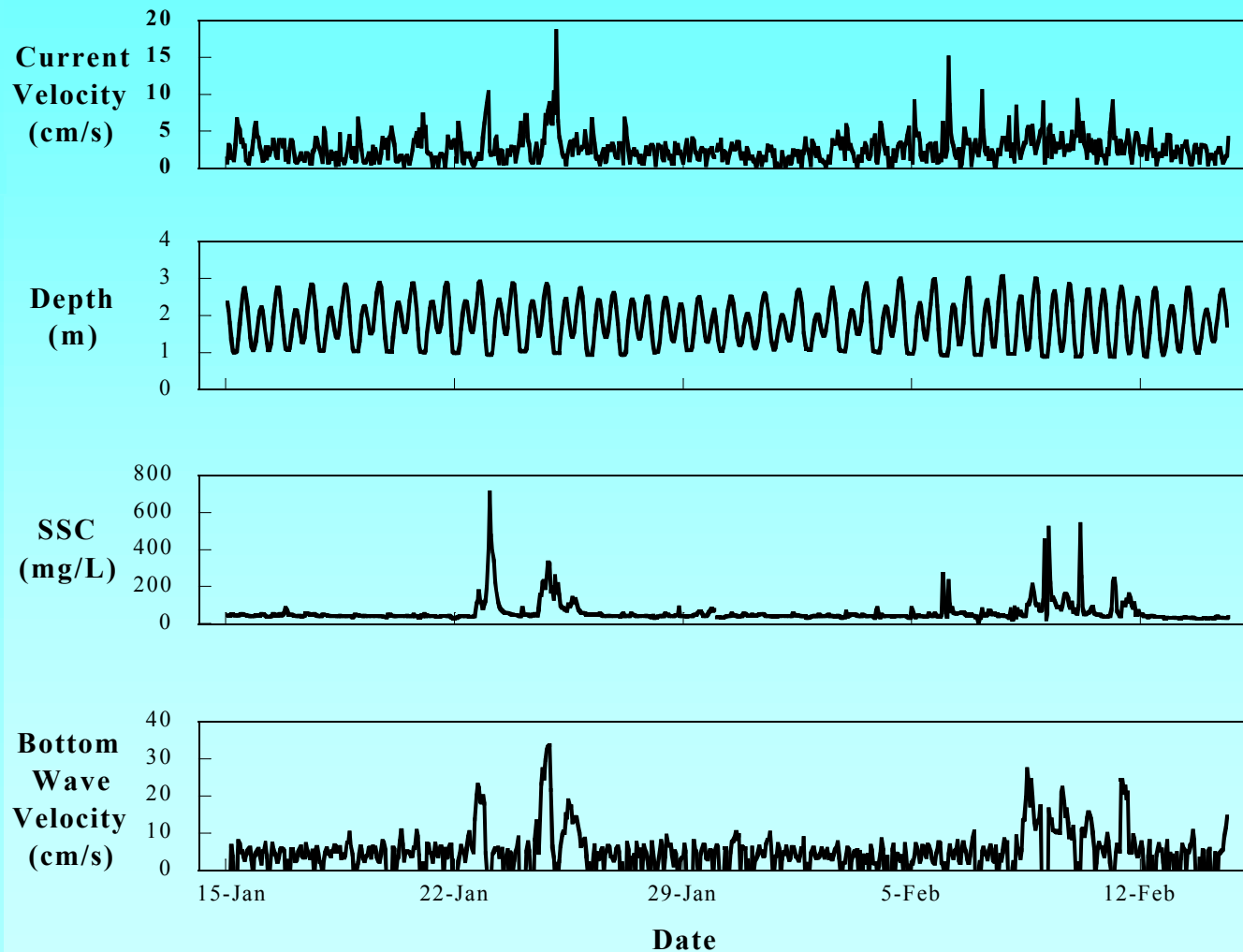


Deployment from 25' vessel



Deployed STMS at Station South 1

STMS Data for Station South 1, Winter 2001

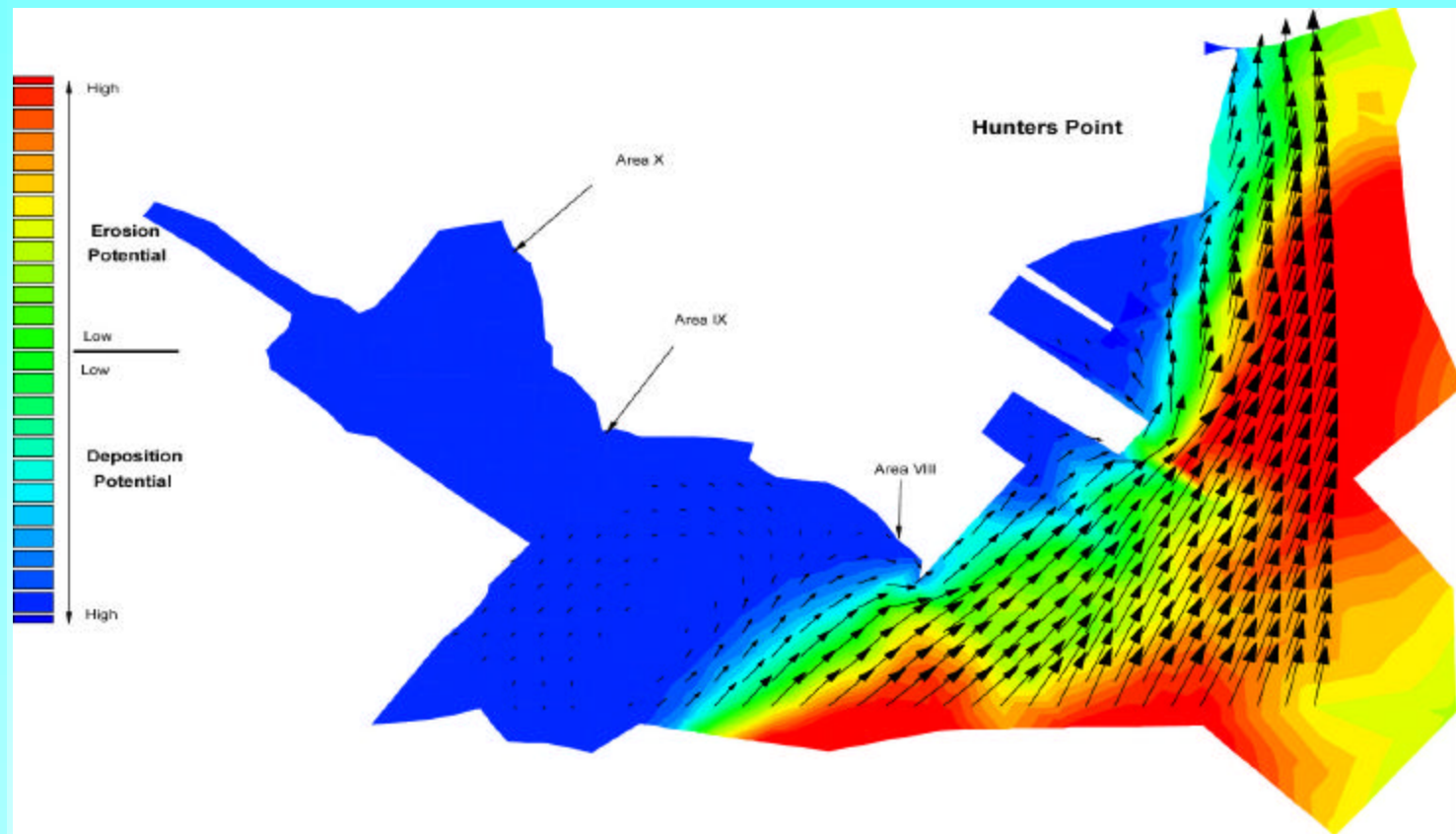


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South Site 1

Regional (2-D) Sediment Transport Modeling

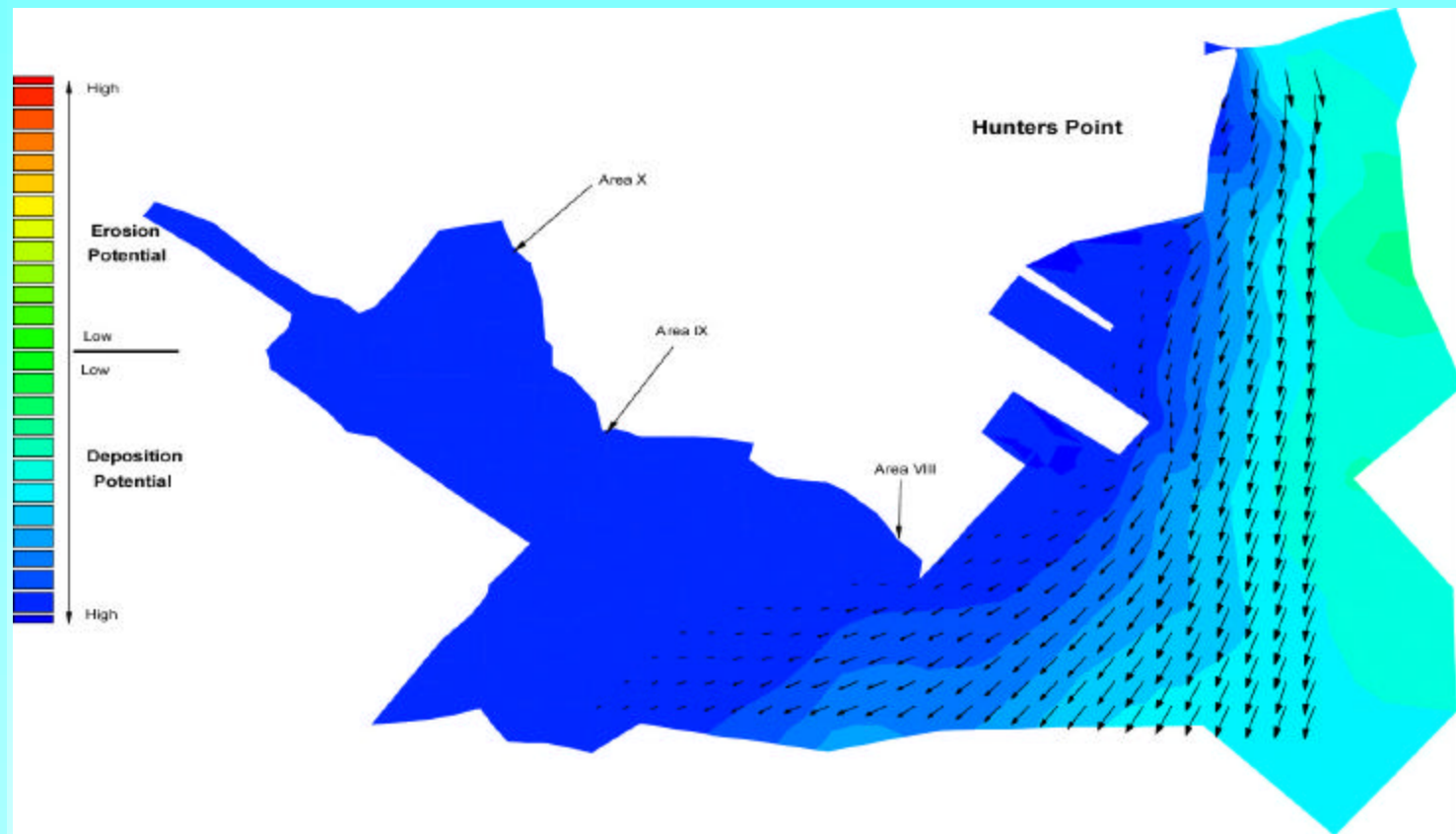
Ebb Tide, Winter 2001



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Regional Sediment Transport Modeling (cont.)

Flood Tide, Winter 2001



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Characterizing Sediment Dynamics: Challenges and Uncertainties

- Ensuring adequate representation of site conditions
- To mark or not to mark stations?
- Biofouling
- Difficulties modeling behavior of fine-grained cohesive sediment in nearshore environments

Conclusions

- Sediment dynamics studies at HPS will provide better data for evaluating viability of natural recovery
- Site-specific data are critical because of uncertainty in sediment transport models
- Future efforts at HPS will focus on potential impact of extreme events and defining depth at which sediments might be considered “permanently buried”